

Plastics in the USSR

I. Introduction

Although the Soviet chemical industry ranks second in the world, it stands only fifth in the production of plastics. In 1962, Soviet production of plastics was less than one-seventh that of the U.S. and Soviet manufacturing techniques for plastics were inferior to those of the U.S. and Western Europe. The older, better known plastics comprise the bulk of Soviet production, although newer types recently have been objects of intensive research. Their ability to resist corrosion and extremes of temperature make many of these newer plastics useful substitutes for metals.

An exceedingly ambitious program for expansion of the Soviet plastics industry was scheduled for the 1959-65 period. Production in 1965 was planned to be more than seven times that in 1958, or about 1.8 million tons, with investment in plastics scheduled to absorb about 20 percent of total investment in the chemical industry.

II. Types

Phenol-formaldehyde, amino, polyvinyl chloride, and alkyd resins are the most important plastics produced in the U.S.S.R., with phenol-formaldehyde accounting for about 29 percent of total output in 1962. Although production of phenolics was scheduled to increase about 300 percent during the Seven Year Plan period its share in total output of plastics is planned to drop by the end of 1965. Phenolics are important for the manufacture of electrical equipment, friction and insulation products, and construction materials.

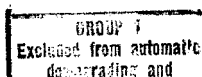
Amino resins, used chiefly in the manufacture of plywood, paints, and laminated plastics, accounted for 12 - 13 percent of total production of plastics at the beginning of the Seven Year Plan period and were scheduled for an 11 - 12 percent increase by the end of 1965.

Polyvinyl chloride is widely employed in the manufacture of consumer goods, corrosion-resistant equipment, plastic pipe, and insulation for cables. During the Seven Year Plan period production of polyvinyl chloride and other vinyl polymers was scheduled to increase 800 - 900 percent.

With production of synthetic materials increasingly an international symbol of the sophistication of a given economy, and with increasingly stringent requirements for the use of plastics in new applications in industry and defense, Soviet plans call for

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greater emphasis on production of more modern types of plastics, largely derived from petrochemicals instead of the coal predominantly used to date. These new plastics include polyethylene and polypropylene, epoxy and polyester resins, silicones, polyurethanes, fluorocarbons and ion-exchange resins. Of these, polyethylene, with myriad consumer and industrial applications, is scheduled for the largest absolute growth. Total output of polyethylene in 1965 probably is planned at 250,000 - 300,000 tons. To accelerate growth of this important plastic the U.S.S.R. has purchased process technology and a number of complete plants from the West.

Silicone, fluorocarbon, epoxy and polyester resins have important industrial and military uses; some finding application as electronic components, others as high-temperature lubricants or laminates, or corrosion and chemical-resistant materials. Production of these types in the U.S.S.R. has been modest and construction of new facilities lagged in 1959-62. As a result, requirements for these products are not satisfied. In 1961 requirements of even the important electrotechnical industry were satisfied only 30 percent for organosilicone products, 40 percent for epoxy resins and 50 percent for fluorocarbons. In addition to shortages of the resins discussed, the U.S.S.R. also apparently has inadequate supplies of ion-exchange resins. These resins have important uses in the processing of uranium ores, in water purification, in the processing of sugar and in the manufacture of antibiotics.

III. Production

Production of plastics in the U.S.S.R. in 1955 and 1958-62 was approximately as follows* (in thousand metric tons):

1955 - 181

1958 - 260

1959 - 294

1960 - 332

1961 - 408

1962 - 480

*Soviet and Western statistics on production of plastics cannot be compared without considering that asphaltic plastics and perhaps one or two other products included in Soviet statistics are excluded in those of Western countries. In addition, some of the materials reported in Soviet statistics on plastics may be used in the manufacture of synthetic fibers.

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Although production increased 85 percent, or 220,000 tons, during 1959-62 this increase was modest in comparison with the Seven Year Plan goal of output of 1.8 million tons in 1965. Construction of new production facilities was far behind schedule at the end of 1962 and completed plants were encountering shortages of raw materials and problems of quality control. Consequently, the U.S.S.R. has imported finished plastics and raw materials for their production. In both 1960 and 1961 these imports were valued at more than 23.5 million rubles.

IV. Consumption

In 1962, 40 percent of the output of the plastics industry of the U.S.S.R. was consumed by the Soviet machine-building industry. A large consumer undoubtedly was the defense industry, although no estimate can be made of its requirements. [REDACTED]

[REDACTED] domestic requirements in the U.S.S.R. in 1965 are planned to require 1.6 million tons of plastics.

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